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A DERMOID CYST OF THE POSTERIOR MEDIASTINUM

Following is the translation of an article by Candidate of Medical Sciences Yu. V. Astrozhnikov entitled "Dermoidnaya Kista Zadnego Sredosteniya" (English version above) in Vestnik khirurgii imeni I. I. Grekova (Herald of Surgery imeni I. I. Grekova), Vol. LXXXIV, No. 5, 1960, pages 109-112.7

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The priority of the first description of a dermoid cyst of the mediastinum, according to the communication of B. G. Stuchinskiy citing Coury, belongs to Pietro Rubino who described it in 1810. In the Russian literature the first description of a dermoid cyst of such a localization belongs to A. Buyvid (1889). In 1952 the statistics of Soviet and Russian authors embraced 56 observations.

S. M. Demkov who collected the largest number of observations of dermoids of the mediastinum (23) distinguishes five basic types of these teratodermoids, depending on the location -- central, anterior-superior, anterior-inferior, posterior-superior, and posterior-inferior. Among the observations of the author, 19 cysts belonged to the first type and four to the second type.

B. Ya. Luk'yanchenko and L. K. Rolik indicate that no more than 10 observations of teratodermoids of the posterior mediastinum have been published in the Soviet literature. Of them, only one observation of an organoid teratoma of the posterior mediastinum, made by N. S. Timofeyev and A. I. Khakham and confirmed by them in an operation, appears to be completely reliable.

Dermoid cysts appear to be congenital. Their origin is associated with a defect of the development and differentiation of one (the ectoderm) or two or three of the embryonic sheets.

Apparently, the overwhelming majority of dermoid cysts proceed without symptoms for a long time, although individual authors who have a considerable number of observations (B. G. Stuchinskiy, O. B. Milonov) consider such a

course comparatively rare. Two cases of death induced by dermoids proceeding without symptoms are described in the literature (Jöel and Smithe).

Left to themselves, teratodermoids often lead to severe complications, described in 90 percent of the patients (B. G. Stuchinskiy): break-through into the bronchi, into the pleural cavity, on the thoracic wall, into the aorta, the pericardium (Cordes). From 15 to 41 percent of the dermoid cysts are subjected with time to malignant degeneration (Yu. Yu. Dzhanelidze, S. M. Demkov, Kent, Heuer and Andrus, Curreri and Gale, and others). In almost all patients the presence of dermoids is accompanied by repeated outbreaks of inflammation of the pleura and the lungs. In a number of cases such an inflammation is the first manifestation of the disease, masks it, and leads to gross diagnostic errors (B. G. Stuchinskiy).

The diagnosis of teratodermoids of the mediastinum presents considerable difficulties. Ordinarily the first clinical manifestations are observed in patients from 20 to 40 years in age. Trauma is very often a stimulus toward the development of a tumor (Yu. Yu. Dzhanelidze, Blades, and others) as more rarely is intercurrent infection. Certain authors note a connection of acceleration of the growth of the tumor with sexual maturation. However, long before this, when the patient feels himself still completely healthy, dyspnea appears to a greater or lesser extent which is a very early, essentially prodromal sign of the disease (Yu. Yu. Dzhanelidze, Harrington, Heuer and Andrus, and others). S. M. Demkov noted in the anamnesis in the majority of his patients a raised fatiguability, a lagging behind contemporaries even in the childhood and juvenile years. Retrosternal pains, coughing, lability of the pulse, and complaints of tachycardia should also be included among the comparatively early signs.

The pronounced asymmetry of the thoracic cage, dilatation of the venous network on the chest and neck, hoarseness, dysphagia, which have been noted in the overwhelming majority of patients by previous authors, are late signs and are being encountered even more rarely with improved diagnosis (Flavell).

Yu. Yu. Dzhanelidze and S. M. Demkov include among the pathognomonic symptoms of teratodermoids the appearance in the sputum of hairs (observed in 20.4% of patients according to Dangschat, in 13.6% according to B. G. Stuchinskiy), of crystals of cholesterol, of desquamated keratotic epithelium, of drops of fat or of flat atheromatous particles. The epidermal elements which are pathognomonic for dermoids can also be detected in the secretions from fistulas and in puncture

specimens (Yu. Yu. Dzhanelidze, B. G. Stuchinskiy).

X-ray investigation has a leading role in the diagnosis of teratodermoids. According to Yu. Yu. Dzhanelidze, one can think of a dermoid cyst when the tumor starts from the anterior mediastinum, is located asymmetrically, protrudes into one of the pleural cavities, has a longitudinal-oval form and is distinctly circumscribed.

However, the only pathognomonic X-ray sign, in the opinion of Yu. Yu. Dzhanelidze, S. A. Reynberg, S. M. Demkov, Lenk, Brewer and Dolley, is considered to be the finding within the tumor of bony formations or of teeth. The frequency of detecting them, according to the data of various authors fluctuates in rather considerable limits: from 3.5% (B. G. Stuchinskiy) to 10-15% (Couri) and 25% (Yu. Yu. Dzhanelidze, L. K. Rolik).

This sign can be considered absolutely pathognomonic only in the presence of an organoid formation of the bony impregnations -- teeth or flat bones, since bony inclusions of another character are also described in the presence of echinococcosis of the mediastinum and of the lungs (G. R. Rubinshteyn, V. A. D'yachenko, Flavell, our own observations), calcified hematomas (B. G. Stuchinskiy), mediastinal goiters (B. Ya. Luk'yanchenko, Flavell), thymomas and neurinomas of the mediastinum (B. K. Osipov, Flavell). What has been said applies to an equal extent to the sign advanced by B. Ya. Luk'yanchenko as "almost pathognomonic" -- the detection of calcified capsules. Nevertheless, we can assert the undoubted value of this sign, which was also noted in our own patient.

We operated on a patient with a dermoid cyst of the posterior mediastinum, the diagnosis of which did not evoke any doubts.

Patient F., 20 years in age, a lathe operator by occupation, was admitted into the division with complaints of dull pains in the chest which had recently become more intense, of hampered respiration, tachycardia, nausea, vomiting, general weakness. Retrosternal pains and a feeling of difficulty in breathing had already been noted for several years, but he had not sought medical advice. The anamnesis included inflammation of the lungs and Botkin's disease [Infectious hepatitis].

At the time of admission the state of the patient was relatively satisfactory. The patient was irritable, emaciated, asthenic. The thoracic cage was cylindrical in form, regularly participates in the act of respiration. The respiration is vesicular, somewhat weakened on the left. The quantity of respiratory movements at rest is 18 per minute, after squatting 10 times -- 38. The boundaries of the heart

as determined by percussion were not changed, the tones were pure. The pulse was labile: at rest -- 72 per minute, after squatting 10 times -- 94 per minute. The Shtange test was 34 seconds. No pathological changes were noted on the part of the organs of the abdomen and the skeleton.

In the X-ray investigation (M. N. Gamarnik) on the left of the sternum at the level of the first - second ribs there was detected a semicircular overshadowing 4-5 cm in diameter with a clearly outlined external contour, of a homogeneous character (see the figure). In the first oblique position the indicated tissue was successfully isolated from the shadow of the spine. In the left lateral position the shadow proved to be located in the posterior mediastinum overlapping the lumen of the trachea.

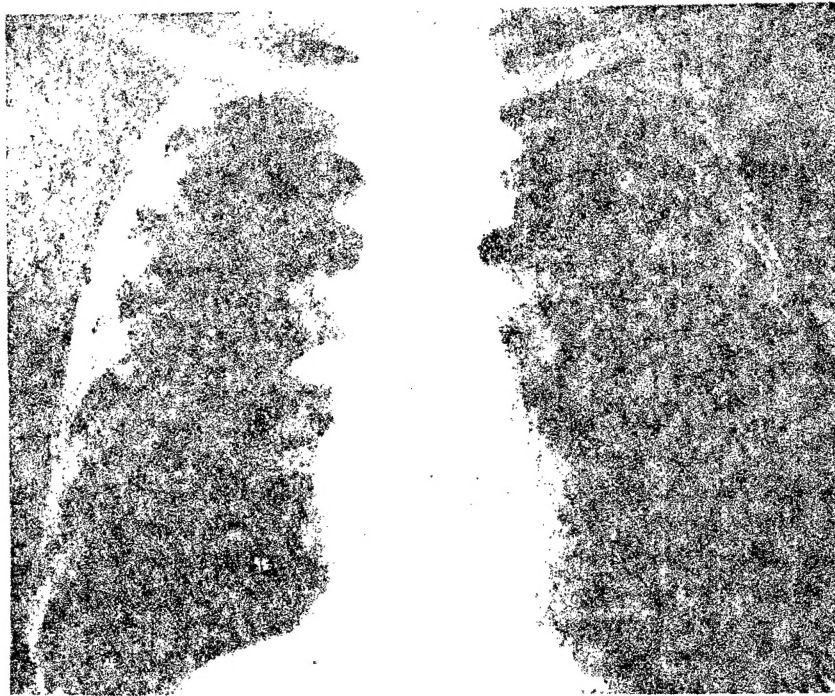
On the tomograms the shadow was best of all manifested in the layers of 8, 9, 10 cm. The external contour was clear-cut, even, in places along the contour there were intensive condensations. There was the same character of condensation on the background of the shadow. No internal contour was manifested. The surrounding pulmonary tissue was not appreciably changed. The tumor was not appreciably enlarged during dynamic observation for the course of six months.

The roentgenological diagnosis was as follows: echinococcosis of the left lung with calcified capsule (2), dermoid cyst of the posterior mediastinum (2).

The blood analysis: Erythrocyte sedimentation rate -- 14 mm per hour, hemoglobin - 16.4 g%, erythrocytes -- 4,130,000 leukocytes -- 10,550. The blood formula: eosinophils - 2%, bacilliform nucleated -- 7%, segmented -- 61%, lymphocytes -- 22%, monocytes -- 8%. The Wassermann reaction was negative.

With the conjectural diagnosis of dermoid cyst of the posterior mediastinum the patient 18 June 1958 underwent an operation under local potentiated anesthesia by the method of Vishnevskiy - Osipov (operated on by Yu. V. Astrozhnikov).

The thoracic cavity was opened by a postero-lateral access in the fifth intercostal space. One could successfully approach the posterior mediastinum only after freeing the upper lobe of the lung from massive adhesions. It was established that the tumor, located in the posterior mediastinum, had fused, on the one hand, with the descending part of the arc of the aorta, and on the other, as it were had grown into the upper lobe of the lung. After opening the pleura of the mediastinum, we proceeded to the tedious isolation of the tumor. Its intimate bond with the aorta compelled us to use the method of B. V. Petrovskiy, to dissect out the tumor and after removing the putty-like contents typical of a dermoid cyst, to isolate the membrane via



Roentgenogram of the thoracic cage of patient F.

hydraulic preparation [preparovka]. The membrane was removed, except for a small area of deepithelized fibrous tissue (1.0 X 2.0 cm) at the arc of the aorta. The lateral part of the tumor was removed via the subsegmental resection of the fibrously changed part of the lung. The wound surface was dusted with streptomycin and pleurized. The thoracic wall was taken in with a rubber tube introduced at the ninth intercostal space and left for 48 hours, through which immediately after the operation the air which was found in the pleural cavity was removed and a solution of streptomycin was introduced. The patient endured the operation completely satisfactorily.

In the microscopic study of a native preparation of the contents of the cyst, on a background of fatty drops covering the entire field cells of a flat keratosed epithelium and numerous cholesterol crystals were encountered.

The histological investigation of the preparation showed that the wall of the cyst consists of a loose richly vascularized fibrous tissue with places of retention of a lining of flat, predominantly keratosed epithelium and with a large quantity of fat covering it.

The postoperative period proceeded smoothly. On 12 July the patient was discharged from the hospital. At the present time he is healthy.

The conservative treatment of dermoids of the mediastinum does not have favorable prospects. B. G. Stuchinskiy, analyzing 95 histories of the disease of non-operated patients with teratodermoids who died, which have been published in the literature, has established that in 88 of them the cause of the fatal outcome was the tumor itself. Palliative operations appear to have equally poor prospects. Of 73 patients who were subjected to various palliative operations, only four recovered, stable fistulas remained in 28, and 34 died (the remote results of seven operations were not indicated).

Completely different results have been observed after radical operations: 130 of 140 patients operated on (statistics of B. G. Stuchinskiy, 1950) recovered and only 10 died. All 22 radical operations conducted before 1950 by Soviet and Russian authors, terminated in the recovery of the patients.

A radical operation was carried out for the first time in 1893 by Bastianelli and in Russia by V. A. Krasintsev (publication by S. I. Sirotina, 1914). We have not encountered mentions of a radical operation on account of teratodermoids of the posterior mediastinum, besides the work of N. S. Timofeyev and A. I. Khakham.

We share the point of view of L. K. Rolik concerning the rationality of the wide intercostal approach without the resection of ribs. In our case the technical difficulties of removing the cyst forced us to add to the wide posterolateral incision by cutting across two ribs. The technical difficulty and the danger of removing dermoids of the mediastinum which are often fused with vitally important organs (the pericardium, aorta) is underlined by a number of authors (Schmiden and others). When it is impossible to remove the tumor as a whole without injuring these vitally important organs one should carefully scrape off the epithelial surface of the areas which are left. The original method, worked out by B. V. Petrovskiy (1954) and used in our patient, renders great aid in the isolation of such tumors.

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